

## Chapter 1 Project – Delivering the Mail

### Description of the problem

A letter carrier needs to deliver the mail to both sides of a street whose length is represented by  $L$  and width by  $W$ . She can deliver to all the boxes on one side, cross the street, and deliver to all the boxes on the other side (see illustration 1). Or she can deliver to one box, cross the street, deliver to two boxes, cross again and deliver to two boxes, and so forth, until all the mail has been delivered (see illustration 2). Which method is better?

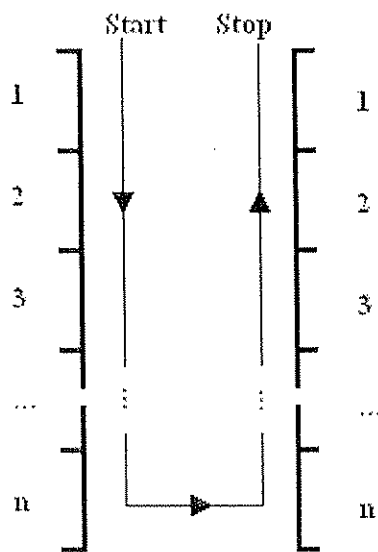


Illustration 1

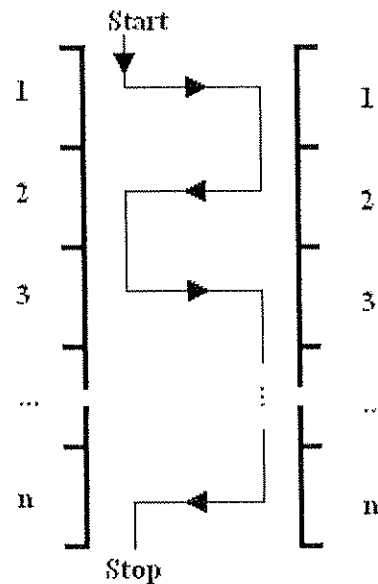


Illustration 2

Note: Illustration 2 implies there are an even number of houses on each side of the street, this may or may not be the case.

Write an expression involving  $n$ ,  $L$ , and  $W$  for the distance the letter carrier travels in Illustration 1.

Write an expression involving  $n$ ,  $L$ , and  $W$  for the distance the letter carrier travels in Illustration 2.

Set expressions equal to one another and solve for  $W$ .

Using your equation above, complete the table below.

$L$	$n$	$W$
300	5	
250	3	
200		25
	10	15
	12	21

Using your original expressions, complete the table below.

$L$	$n$	$W$	Length of 1	Length of 2
200	5	30		
250	6	40		
300	6	45		
450	7	45		
500	8	50		

If you were the letter carrier and you had to choose one of the two suggested paths, which would it be and why?